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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE

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GERONTOLOGY

Aid Humans in Old Age

➤ ANIMALS with short life spans may help human beings live healthier lives to a ripe old age.

Studies of such short-lived animals as rats, mice and guinea pigs may show doctors what body factors to suppress in humans and what to supply them with individually in order to slow down the aging process, Dr. Sidney Olansky of Emery University, Atlanta, reported.

Dr. Olansky, a delegate to the White House Conference on Aging in Washington, D. C., and chairman of the conference work group on sensory changes and consequences, said his group favored such animal studies to learn more about all sensory changes in the aged, including vision, hearing, skin, taste and smell.

He said studies with quick-aging animals living under controlled conditions may enable doctors to:

1. Control conditions existing in the body (from disease and injury).

2. Understand how disease and injury occur in the body.

3. Understand genetic factors connected with aging to supply chemicals the body needs (perhaps pigment if too little in the skin) or to suppress the excess in the body (perhaps excess sensitivity to light due to antibodies).

Dr. Olansky said two recommendations his group will make to Congress are:

1. Establishment of centers for study of aging in key geographical locations, where the influence of climate, heredity and racial characteristics can be studied.

2. Investigation of itching, a serious problem in the aged, among both old persons and young ones who suffer from premature aging of the skin.

Comparing young persons with aging skin, but without the other old age characteristics or diseases, with young persons without aging skin might show a measurable factor, which could then be applied to the aged, Dr. Olansky said.

• Science News Letter, 79:34 January 21, 1961

Ignore Healthy Oldsters

➤ THE PRESENT SYSTEM of spending millions of dollars on care of the sick while virtually ignoring the opportunities for prevention of illness and preservation of health is like "stamping out brush fires rather than clearing the undergrowth," Dr. Leonard W. Larson, president-elect of the American Medical Association, believes.

Dr. Larson, at an opening session of the White House Conference on Aging in Washington, D. C., restated a point emphasized repeatedly by the AMA in its fight against efforts to include medical care for the aged in social security provisions, namely, that most elderly persons are well.

"We must do more than react to the minority of older persons who are ill," he said. "We must act for the great majority who are well. We must shift our emphasis from defense to offense."

The individual's responsibility for his own health, the development of lifelong habits of healthful living, should begin in grade school so that children will realize that they are planning for 80, 90 or 100 years of useful life.

In addition, Dr. Larson said, the older person must have a reason for living longer.

"Medical progress and rising standards of living have granted us the gift of added years. A major question we must now answer is 'For what?' "

• Science News Letter, 79:34 January 21, 1961

CYTOLOGY

Tissue Rejection Explored

➤ AN ELECTRON MICROSCOPE producing images 100,000 times the size of the original object will be used at Peter Bent Brigham Hospital in Boston in an attempt to discover why tissue transplants such as kidneys are rejected.

Dr. Gustave J. Dammin, professor of pathology at Peter Bent Brigham Hospital and Harvard Medical School, reported the receipt of a $45,573 grant from the National Heart Institute, U. S. Department of Health, Education and Welfare, for purchase of the microscope.

It was at Peter Bent Brigham Hospital that a kidney transplant was made between non-identical twins, using total body irradiation, Jan. 24, 1959. But this was after numerous failures, even in transplants between identical twins.

Dr. Dammin was one of the six physicians involved in the successful transplant between non-identical twins. It is his hope that the electron microscope will reveal cellular changes not seen with the most powerful optical microscopes, which can magnify only 5,000 times the size of the original object.

"In our studies of cell and tissue fractions," he said, "the constituents found to be antigenic (producing antibodies) may be characterized better through electron microscopy."

Dr. Dammin said the electron microscope could make important contributions to the study of "clinical problems related to kidney malfunctions, high blood pressure and related diseases."

Dr. Joseph M. Corson and Dr. Lewis T. Mann Jr. will be associated with Dr. Dammin in the electron microscope program. Dr. Dammin said the information available through this microscope would aid investigators in medicine, surgery and radiology as well as pathology.

• Science News Letter, 79:34 January 21, 1961

PUBLIC HEALTH

Good Health Postpones Compulsory Retirement

➤ COMPULSORY RETIREMENT at the age of 65 is declining, partly because more older employees are in good health than they were a generation ago.

An editorial in the Journal of the American Medical Association, 174:2227, 1960, reports that a sizable number of firms liberalized their retirement programs after the AMA committee on aging asked labor and industry to re-evaluate their arbitrary retirement systems.

Among other reports in the AMA's official magazine, p. 2229, is one predicting a large increase in lung cancer as tuberculosis deaths continue to decline.

Drs. Broda O. Barnes of Denver, Colo., and Max Ratzenhofer of Graz, Austria, base their conclusions on data from 25,546 autopsies performed during the past 15 years at the University of Graz. Of the cases studied, 868 had lung cancer.

During the period of study, the researchers report two important changes took place. First, the average age of patients who died from tuberculosis was increasing, so the tubercular patient was approaching the "cancer age" before death. Second, the association of tuberculosis with malignancy became more frequent.

They report that, if their observations are confirmed, it appears there are two diseases competing for the same person: tuberculosis at an early age and lung cancer as he grows older.

A trouble-shooting clinic for emotional problems at City Hospital, Elmhurst, Queens, New York, initiated by Dr. Leopold Bellak, director of psychiatry, is said, (p. 2214) to give the kind of service that could aid the "lonely crowd" in every community.

The clinic is open 24 hours a day so that anyone can walk in and talk over his problems. To date, it has handled more than 2,000 cases.

• Science News Letter, 79:34 January 21, 1961

GENERAL SCIENCE

MIT Engineer Named As Science Adviser

➤ SPECIAL ASSISTANT for Science and Technology to the new administration is Dr. Jerome B. Wiesner, electronics engineer and radiation specialist at the Massachusetts Institute of Technology.

A long-time friend of President-elect John F. Kennedy, the 45-year-old scientist served during the recent political campaign as the Democratic candidate's top adviser on nuclear disarmament and test suspension. But even while he was actively campaigning for Kennedy's election, he served on the Science Advisory Committee to President Eisenhower, for whom he has the highest regard and respect.

At all times, his advice on scientific matters was the same to both men and did not reflect his political leanings.

• Science News Letter, 79:34 January 21, 1961

GERONTOLOGY

Bill of Rights for Aged

A bill of rights for senior citizens was approved by delegates to the White House Conference on Aging. It included the right and responsibility to keep active and independent.

➤ DELEGATES to the White House Conference on Aging in Washington, D. C., approved a nine-point bill of rights for senior citizens and outlined the obligations of persons over 65.

The central theme of both the obligations and the rights is to keep the elderly person working, active, productive and independent as long as possible.

The rights mapped out included "freedom from want in old age," a fair share of the community's recreational, educational, and medical resources, the right to obtain decent housing suited to needs of later years, to live independently, as one chooses—to live, to die, with dignity.

At the present level of income, it will be difficult for persons over 65 to enjoy freedom from want. Between 50% and 60% have incomes of less than $1,000 per year, and medical costs in this age group are twice those for the average American.

The odds for maintaining mental and physical health through age 75 are good and getting better. For this group, the right to be useful and to keep on working is particularly pertinent.

Another point in the report is that many women will be entering the labor market for the first time after age 50, indicating the right to begin working at a relatively late date. The report was drafted by the section on Population Trends: Social and Economic Implications.

• Science News Letter, 79:35 January 21, 1961

Kin of Aged Should Help

➤ A PROPOSED RESOLUTION drawn up by delegates to the White House Conference on Aging in Washington, D. C., is aimed at making relatives contribute to support of the elderly.

Of 2,359,000 persons now receiving OAA (old age assistance) payments, 74% have living children, but only one in every five is receiving support from the children.

In some states relatives are required to contribute to the support of elderly persons. This amount is deducted from the amount paid by the state, and state and Federal funds are used to make up the balance. In some cases the relatives do not contribute, and the aged person receives only a fraction of his requirements from the state and Federal governments.

• Science News Letter, 79:35 January 21, 1961

GERONTOLOGY

Depression Masks Disease

➤ IF AN OLDER PERSON is depressed, it is very likely he or she has a serious illness without knowing about it.

Dr. Ewald W. Busse, chairman of Duke University's psychiatry department, told SCIENCE SERVICE that detailed clinical examinations of emotionally depressed older persons showed many of them had serious illnesses, such as cancer or a heart condition, without having any symptoms.

Physicians once thought that depressions in older persons were due to their surroundings and their adjustment to them, Dr. Busse said. Now it seems that the origin of much old-age depression is not social but physical.

Dr. Busse said studies have shown that rejection of the oldsters by the younger generation usually begins after the older person is already depressed. He said that "silent physical change" is a much greater factor in producing mental disturbances than realized before. Many psychoneurotic reactions in older persons are really psychosomatic.

Dr. Busse was a delegate to the White House Conference on Aging, and chairman of medical research for the Conference.

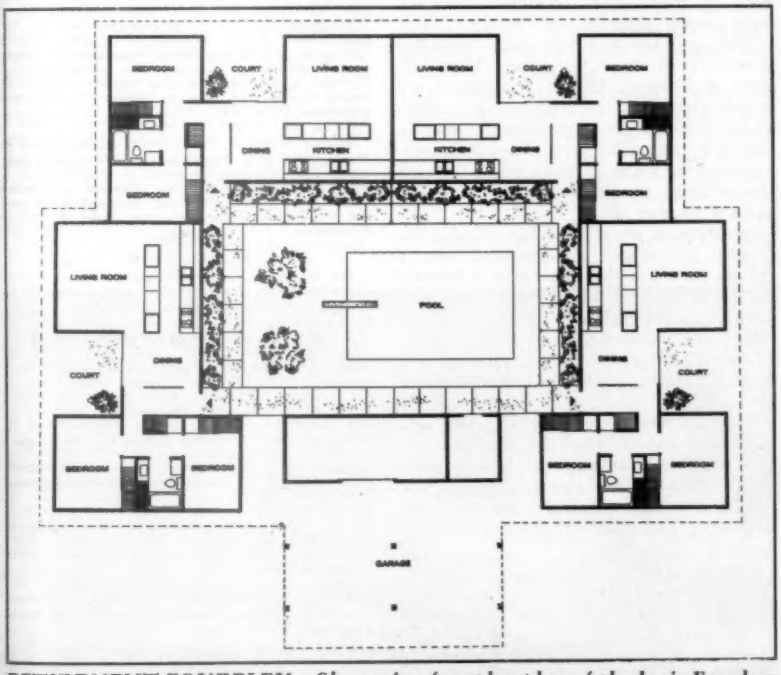
Dr. Busse said one recommendation likely to result from the Conference is establishment of a national institute for aging, such as already established for cancer and heart disease as part of the National Institutes of Health. At the proposed institute, the problems and diseases especially prominent in advanced age groups would be studied.

Studies at such an institute should also include all diseases in persons above a certain age, especially cancer and heart disease, since they are the greatest killers among older persons, Dr. Busse said.

He called the study of the aged over periods of years, which has thus far been neglected, of great importance. This study could provide accurate histories, important to the understanding of the aging process. Histories taken from the patients' memories are not always reliable as study material as many persons suffer memory loss about what has happened to them as they grew older.

Present programs at the NIH along these lines need strengthening, Dr. Busse said. He noted that studies of the aging process in animals, especially in monkeys and chimpanzees, would be of great value for understanding the aging process in humans.

• Science News Letter, 79:35 January 21, 1961



RETIREMENT FOURPLEX—Shown is a fourplex plan of the basic Freedom House, built in Washington, D. C., for the White House Conference on Aging. Designed and built by Douglas Fir Plywood Association, Tacoma, Wash., in cooperation with the American Association of Retired Persons, Freedom House has non-skid floor coverings, low-set light switches for persons in wheel chairs and bath with built-in seat for sit-down showers.

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MEDICINE

Lung Cancer Cells Grown

➤ LUNG CANCER can be studied in the laboratory under controlled conditions for the first time.

Dr. Relda Cailleau of the Cancer Research Institute, University of California Medical Center, San Francisco, has grown lung cancer cells in test tubes. Scientists can, therefore, now study the specific physical and chemical behavior of human lung cancer.

Dr. Cailleau has found that the cancer cells have an abnormal number of chromosomes, averaging 79 chromosomes instead of the 46 normally found in tissue cells.

Chromosomes are the hair-like fibers appearing in the nucleus of a cell when it divides or reproduces. They contain the genes that control inherited characteristics.

The cancerous tissue, removed from a human lung in January, 1959, was first grown in covered dishes. Part of the tissue, containing 200 to 300 cancer cells, was later placed in a special flask which was filled with a nourishing liquid.

After about a month, the cells suddenly began to multiply. Since then, Dr. Cailleau has been transferring some of the still-malignant cells to a new flask every two weeks for further study.

Although many kinds of cells are being grown in laboratory flasks, cultures of human lung cancer are extremely rare. One reason is that it is difficult to tell whether the cells that finally grow are cancer tissue cells or normal cells that are often mixed in with them.

• Science News Letter, 79:36 January 21, 1961

MEDICINE

Amoebic Infections Test Called Promising

➤ PRELIMINARY STUDIES of a test for amoebic infections, the scourge of travelers to tropic and semitropic countries, have shown promise.

The test involves the usual serologic procedure in which substances from cultures of amoebae, known as antigens, are mixed with the blood serum of the subject to be tested. If the subject has an amoebic infection, he will have developed antibodies to the amoeba. The reaction between the amoebic antigen and the antibodies gives a positive test.

In previous blood tests for amoebic infections the antigen was produced from a culture in which the amoebae and bacteria normally found in the intestinal tract were grown together. Thus antigens of both bacteria and amoebae were in the test material. If the subject also had antibodies to the bacteria, a false positive test was likely to occur.

The new test was developed by Dr. John F. Kessel and William P. Lewis of the University of California at Los Angeles Medical School. An antigen prepared in a culture free from intestinal bacteria is used, helping to make the test more specific for amoebic infections.

Samples of blood from Indonesia, Mexico, Australia, South Africa and the Los Angeles area were used in preliminary evaluation of the new test.

Among 62 cases with amoebic dysentery or other proved symptoms of infection, only one blood test was negative. Blood serum from 48 persons with no symptoms of infection was negative with the exception of that from one person who had recently traveled in Mexico.

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ASTRONOMY

Star Cluster's Mass Found

THE NEAREST of all star clusters, the Hyades in the constellation Taurus, the bull, has a mass about 500 times that of the sun. The cluster, which includes the bright reddish star Aldebaran, is at a distance of 130 light years, one light year being six million million miles. Drs. R. S. Kushwaha and D. S. Kothari of the University of Delhi, India, calculated the mass of the Hyades on the basis of their new theory of fragmentation.

The Hyades cluster, a group of a dozen naked-eye stars, is actually a loose organization containing at least 150 individual members. Their association in a gravitational system has been revealed by their observed similar motions, across the sky as well as in the line of sight.

The Hyades played a part in ancient mythology. The stellar group has often been linked with weather lore and called the "rainy Hyades."

The equally famous Pleiades, also in Taurus, is another open cluster, near the Hyades in the sky but actually more distant in space (230 light years). The Pleiades cluster is composed chiefly of hot, white stars enmeshed in dust and gas, a medium from which the Hyades are free.

The fragmentation theory of Drs. Kushwaha and Kothari is applied to the pre-star nebula from which the Hyades presumably condensed a billion years or so ago. The total mass is estimated from the frequency distribution of the masses of the individual stars.

The Hyades cluster will eventually dissolve, since it is a part of the Milky Way galaxy, the rotation of which introduces a shearing action on the open stellar groups.

The part of the Hyades cluster most distant from the galactic center will lag behind in its 200,000,000-year journey around the galactic nucleus. In time, the cluster will be a stream of stars rather than a gravitationally organized star cluster. Eventually its members will be lost in the general star fields of the Milky Way.

The Pleiades, being a tighter group, will resist dissolution longer.

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ASTRONOMY

Manned Star Observation

FOR THE FIRST TIME man will be able to view the stars through a telescope at altitudes from 50,000 to 80,000 feet, the Air Force Research and Development Command announced.

This spring a giant balloon is scheduled to carry to these heights the Air Force's high-jumping parachutist Capt. Joseph Kittinger and astronomer William White in a specially designed and sealed gondola, carrying a stabilized telescope.

The manned balloon star-gazing project, piloted by Capt. Kittinger, has as its scientific director Dr. J. Allen Hynek, director of Northwestern University's Dearborn Observatory in Evanston, Ill.

Dr. Hynek has worked on this project with the Air Force for close to two years.

"If it is successful, my own personal feeling is that this will be a real breakthrough for balloon astronomy and will advance the gathering of important astronomical data," he said.

"At the altitudes from which Mr. White will observe the heavens, he will be about 90% to 95% above the earth's atmosphere. Through the 12-inch stabilized telescope fixed in the gondola, he should be able to see the stars and photograph them free from the distortions caused by the atmosphere," Dr. Hynek said.

The primary purpose of this experiment, the first in a series of four manned flights scheduled for both Capt. Kittinger and Mr. White, who is attached to the Naval Ordnance Test Station at China Lake, Calif., is to determine all the physical and technical requirements that are best suited for balloon astronomy.

"It is a basic research project," Dr. Hynek said. And one of the major elements in whether it is successful or not is whether the telescope can be successfully stabilized.

Previous attempts under Navy auspices did not succeed. The job of assuring the stabilization has been assigned to the Massachusetts Institute of Technology.

• Science News Letter, 79:37 January 21, 1961

ULTRAVIOLET "SEEING EYE"—The Uvicon is installed in a TV camera.

ASTRONOMY

Electronic Device "Sees" Ultraviolet Light in Space

AN ELECTRONIC device that promises, when rocketed above the earth's atmosphere, to give man a view of the universe as it looks in ultraviolet light has been developed by scientists at Westinghouse research laboratories in Pittsburgh.

The device is an electronic image tube sensitive to the shortwave ultraviolet light sent out by stars and from interstellar space. It is called the Uvicon and was developed for the Smithsonian Institution's Astrophysical Observatory, Cambridge, Mass.

The Uvicon will be used in Project Celescope, one of several experimental launchings planned as part of the National Aeronautics and Space Administration's orbiting astronomical observatory program. First of the orbiting observatories is planned for 1963.

The ultraviolet- telescope package consists of an optical arrangement to form the ultraviolet images, the Uvicon tube and its television camera and a transmitter to broadcast signals back to earth. It will go into the nose cone of an Aerobee-Hi rocket that will take it to an altitude of about 150 miles after launching from NASA's Wallops Station, Va.

Useful portion of the flight will be the five minutes spent above an altitude of 60 miles, the height at which the ultraviolet radiations of interest are no longer absorbed, Dr. Robert J. Davis, Smithsonian astrophysicist in charge of Project Celescope, said.

Ultraviolet light is just beyond the blue end of the spectrum of visible light. Ultraviolet radiations near the frequency of visible light penetrate the atmosphere and can cause sunburn or tanning.

Those of higher frequency, or shorter wavelength, are ones to which the Uvicon is especially sensitive, including wavelengths of five-millionths to eight-millionths of an inch.

• Science News Letter, 79:37 January 21, 1961

PUBLIC SAFETY

Reactor Hazards Stressed

➤ THE FATAL atomic explosion near Idaho Falls, Idaho, Jan. 3, has emphasized the hazards of building nuclear reactors near large population centers.

This was underscored by Dr. Russell V. Morgan, dean of the new school of radiobiology at Johns Hopkins University, Baltimore, and Walter P. Reuther, president of the United Auto Workers, AFL-CIO, in statements made independently.

In releasing a study of 40 reactor accidents prepared by the AFL-CIO, the labor leader said the Idaho explosion had confirmed the "validity of the trade union opposition to the construction of the untested fast-breeder reactor near Detroit."

This reactor, he pointed out, is 300 times larger than an experimental model that exploded at the National Reactor Testing Station, Nov. 29, 1955.

The U. S. Court of Appeals upheld a court action brought by the AFL-CIO to stop the Atomic Energy Commission from granting a construction permit for the fast-breeder reactor in Lagoona Beach near the heavily populated Detroit-Toledo areas. The case currently is up for review by the U. S. Supreme Court. Thousands of persons would have been overexposed to radiation from the Idaho reactor accident, Mr. Reuther said, "if the stationary low-power reactor had been in a populated area."

Dr. Morgan told SCIENCE SERVICE the position taken by Mr. Reuther on the question of location of reactors, particularly the fast-breeder type, was correct.

He pointed out that industrial determination of location often is based on economic cost. The element of safety is paramount, the radiation specialist said. He believes the economic saving involved in placing such reactors in heavy populated areas is not great enough to justify the human risks inherent in such placement.

A reactor of the same type as that approved by the AEC for Lagoona Beach is being planned for construction at Peach Bottom in York County, Pa.

The York County site is on the Susquehanna River, nine miles above the Conowingo Dam, very close to the location scheduled for intake pipes that by 1962 will supply water to Baltimore, 38 miles away.

Although the population problem is not as acute in this area as in the Detroit-Toledo section, the chances of contamination of a major water supply for a large city raise serious questions, Dr. Morgan said.

"These questions, raised by the AEC advisory committee on reactor safeguards," he said, "should be answered before full power operation of the proposed Peach Bottom reactor can be considered."

The questions include the absence of a safe system for waste disposal, failure to provide either a secondary back-up safety system or an emergency coolant system, and no evidence to show that such safeguards are not needed.

• Science News Letter, 79:38 January 21, 1961

PUBLIC HEALTH

Cancer Relation Studied

➤ THE RATE of cancer occurrence may be related to man's environment. Cancer seems to occur more often in populated regions where radiation is much higher than normal, due to radioactive rocks.

In a survey of radioactivity by Government geologists in Washington County, Md., distinct differences in the radioactivity of rock masses were found. Some rocks were ten times more radioactive than others in the county. Although the number of higher radiation readings was relatively small, the higher readings seemed to be in populated areas where the cancer rate was higher than normal.

The radioactivity survey is part of a program initiated by the National Cancer Institute, Bethesda, Md., to see if the geographic distribution of cancer in the county is related to various factors in man's surroundings. The program, conducted in cooperation with the Washington County Health Department, includes both checking available information on the county's present population, and analyzing the vegetation, soils and rocks in the county.

Before the scientific studies were begun, old population records were checked for accuracy and the death rate from cancer. The population was grouped according to election districts, because these were the smallest geographical units for which accurate records had been kept. Preliminary results show that certain districts definitely had a higher rate of cancer than others.

In addition to the radiation survey, scientists also analyzed samples of soils and plants for traces of elements that may influence the rate of cancer. An unusual distribution of elements, which may be related to the type of soil in the area, was found.

• Science News Letter, 79:38 January 21, 1961

PUBLIC HEALTH

No Bad Effects Found From Oral Contraceptives

➤ A COMPREHENSIVE two-year study of the new oral contraceptives has revealed no undesirable effects of the drugs on a large group of women who participated in the trial.

Drs. Dean Moyer, Edward T. Tyler, Henry J. Olson and Louis J. Zeldis of the University of California, Los Angeles, Medical School made the study.

A total of 1,653 subjects, all of whom were patients at the Los Angeles Planned Parenthood Center, were studied. The investigation included studies of vaginal smears and samples of tissue (biopsies) from the lining of the uterus. Some of the group had been using the drugs for as long as 42 months, with 31 months being the average.

There had been some concern that the rather potent synthetic progestational hormones in the drugs might contribute to disorders of the genital tract or uterus. The effect of the drugs is to produce hormonal responses in the endocrine glands that block release of eggs (ovulation).

The investigators found no evidence that malignancy had developed in any subject since the drug program had begun. Eight of the group had evidence of malignancy prior to initiation of the program.

• Science News Letter, 79:38 January 21, 1961

AWARD WINNER—
Sir John Cockcroft

PHYSICS

Briton Awarded 1961 Atoms for Peace Award

➤ A NOTED British physicist and educator, Nobelist Sir John Cockcroft, will receive the 1961 Atoms for Peace Award.

He will be awarded $75,000 and a gold medallion symbolizing the award at the Massachusetts Institute of Technology, Cambridge, Mass., on April 6.

Sir John's contributions to the peaceful uses of the energy within the atom range from the first demonstrations that the energy can be released to the direction of the development of full-scale nuclear-powered generating stations supplying electricity to England.

Sir John received the Nobel Prize for Physics in 1951 for developing, with Nobelist E. T. S. Walton, the first apparatus to accelerate atomic particles artificially.

The Atoms for Peace Award was established in 1955, as a memorial to Henry and Edsel Ford, to help promote international efforts to develop nuclear energy for peaceful purposes. The first award was given to Nobelist Niels Bohr of Denmark in 1957.

• Science News Letter, 79:38 January 21, 1961

TECHNOLOGY

Electricity From Fusion

▶ A RUSSIAN SCIENTIST predicts that electricity will be produced by nuclear fusion using water as the raw material "maybe tomorrow, maybe in 10 years."

British, American and Russian scientists are working on the problem of controlling thermonuclear (H-bomb) reactions for peaceful purposes.

Writing in Pravda, Academician N. N. Semyonov says that the difficulties are still very great, "but undoubtedly this problem will be solved."

He foresees a time when human physical work will no longer be necessary. The world-wide use of electric energy could be increased a hundred-fold, the Russian says, by thermonuclear electric power stations and other new sources of power.

Such an abundance of energy could be used to control the weather, Prof. Semyonov predicts.

He forecasts use of three other sources of electric energy: the "electricheskii element" or fuel cell; the direct conversion of the sun's rays into useful energy, and the heat deep in the earth that wells up periodically in the form of lava and geysers.

The fuel cell would chemically produce electricity without the heat transfer, mechanical moving parts or boilers required in conventional power plants. The efficiency of such a system would be 100% theoretically. But in practice it would be only 70%, Prof. Semyonov believes.

A fuel cell similar to an electric cell battery, but more powerful and efficient, would be most useful in transport and agriculture. Prof. Semyonov expects such a device will be in use in 10 to 15 years.

The greatest source of energy in nature is the sun. Plants convert the sun's radiant energy into chemical energy, but they are less than 10% efficient, according to Prof. Semyonov. Man someday will be able to convert solar energy into electricity at the rate of 40% to 45% efficiency, he predicts, urging scientists to work on the problem because "the quantity of solar energy is so immense that this would be an inexhaustible source of energy."

Using the heat in the earth's molten core is theoretically possible, Prof. Semyonov reports, but he does not predict when it will be done.

• Science News Letter, 79:39 January 21, 1961

ARCHAEOLOGY

Glass Dated by Its Crust

▶ THE AGE of ancient glass can now be measured by counting rings in its weathered crust.

Dr. Robert H. Brill of The Corning Museum of Glass and Harrison P. Hood of Corning Glass Works, Corning, N. Y., developed the new dating method.

When objects of glass are buried in soil for a long time or submerged under water, they often undergo a slow chemical deterioration that produces a surface crust. This is comparable to the rusting of metal objects but takes place at a much slower rate.

When the weathering crust, generally one to two millimeters thick, is examined in cross-section under a microscope, tiny separated layers can be observed. These layers are so thin that about 30 of them would have to be stacked to make the thickness of a human hair.

The scientists assume on the basis of good chemical evidence that a single layer is the result of one year's decomposition. By counting the layers, it can be determined how long the glass has been buried.

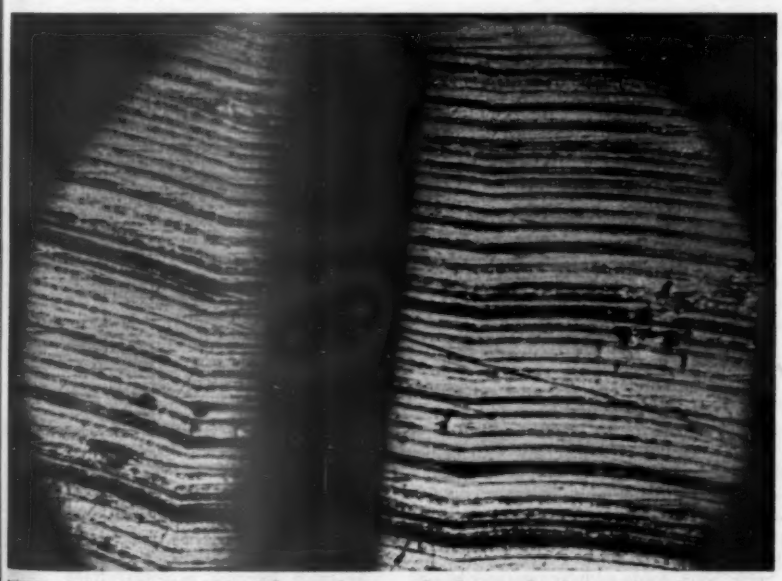
The method is similar to the counting of tree rings to measure a tree's age, except that the glass-age method involves a destructive process rather than a process of growth.

Validity of the method was tested by counting layers in weathering crusts from objects buried for known periods of time.

The oldest object yet studied was a fragment found in the ruins of the ancient city of Sardis, Turkey. The building where it was found is believed to have been built in the late third century and was probably destroyed early in the seventh century.

The ring-counting technique indicated the fragment was buried about 378 A.D., plus or minus ten years.

• Science News Letter, 79:39 January 21, 1961



THE AGE OF GLASS—Photomicrograph shows the layers in glass crust.

PHYSIOLOGY

Blood Pressure Changes With Arm Position

▶ IF A PERSON'S arm hangs down toward the floor when the doctor checks his blood pressure, the pressure will increase between 5% and 20%, enough to mark some otherwise healthy persons as unfit military candidates, or poor risks for insurance companies.

How different arm positions result in different arterial blood pressures has been measured by Drs. John Merendino and Frank A. Finnerty Jr. of Georgetown University School of Medicine, Washington, D. C.

They found that even slight increases in blood pressure are believed to tell a great deal about the progression of a disease. Doctors are usually meticulous in choosing a standard inflation cuff and stethoscope, in fitting the cuff to the arm properly, in cautioning patients to avoid deep breathing and in recording pressures for recumbent, sitting and standing positions of the patient. But very often little or no attention is given to arm position.

In 104 patients between 14 and 63 years of age, 78 of whom had normal blood pressure and 26 of whom were hypertensive, pressure was recorded with the arm in two different positions. In the first position the forearm was slightly flexed and rested on a table; the hand was open. In the second position the arm was lowered about 60 degrees and rested in downward position beside the body.

In all cases the second position resulted in higher pressure than did the first. About three-fourths of the patients showed a pressure increase between 5% and 20%. Both systolic and diastolic pressures were equally influenced and reactions of normal and hypertensive patients were about equal, the physicians report in the Journal of the American Medical Association, 175:51, 1961.

• Science News Letter, 79:39 January 21, 1961

SOCIOLOGY

Supports Basic Research In Social Sciences

➤ THE NATIONAL Science Foundation has now a new division to handle grants to support basic research in the social sciences. Assistant director of the new division is Dr. Henry W. Riecken, psychologist on leave of absence from the University of Minnesota.

Current budget for the new division is $3,400,000, which should support about 130 grants.

The need for increased support by the Government for basic research in the social sciences was stressed by Dr. Alan T. Waterman, director of the National Science Foundation, when he reported establishment of the new division.

"Several large private foundations have either diminished their support of basic research in the social sciences or have shifted the emphasis of their support to applied social sciences," Dr. Waterman said.

"Some of the foremost social scientists in the United States are now pursuing research under Foundation grants. Establishment of the new division should indicate to them and their colleagues that the Foundation is pledged to assist in the study of basic problems in the social sciences and the development of research techniques, rather than applied craftsmanship in social affairs or in contemporary social problems.

"We are confident, as well, that this action will help to attract into the fields of the social sciences additional able young investigators whose interests and skills equip them for such work," Dr. Waterman said.

• Science News Letter, 79:40 January 21, 1961

NUTRITION

Gain Less Fat Nibbling Than Eating Two Meals

➤ RATS FED their food in two daily meals store more fat and less protein in the body than rats allowed to nibble freely throughout the day.

There is also a difference in body composition between rats eating large meals and those nibbling whenever they so desire.

This factor, not generally stressed by nutritionists, may be important in understanding diseases in man who has become a meal-eater rather than a nibbler in order to adapt to his social conditions.

Researchers found that in two groups of rats, the bodies of animals allowed to nibble contained 20.4 grams of fat, or 9.6% of the body weight. The bodies of force-fed (on the meal-eating schedule) animals contained 39 grams of fat, or 17.6% of the body weight.

The nibblers gained only 0.3 grams of fat in a two-week period while the force-fed animals gained 23.7 grams of fat.

Of another group of rats, the nibblers gained an average of 12.9 grams of protein and only 4.9 grams of fat while the force-fed animals gained only 9.9 grams of protein and 13.2 grams of fat.

Researchers also found that when a natural nibbler is made to take its food in the form of large meals, it conserves more calories and stores them as fat.

When determining the efficiency of a diet, the amount of weight gained per unit weight of food consumed is compared. Doing this, researchers found that the food consumed by the rats was twice as efficient when eaten as a meal than when nibbled over a longer period. The findings are reported in the Nutrition Reviews, 19:9, 1961.

• Science News Letter, 79:40 January 21, 1961

ROCKETS AND MISSILES

Pogo, Ego and Ogo To Orbit in Space

➤ POGO will be launched in a polar orbit within three years, the National Aeronautics and Space Administration reported in Washington, D. C.

NASA's POGO is a variation of OGO, an orbiting geophysical observatory, to be built by Space Technology Laboratories, Inc., Los Angeles, Calif. The contract calls for delivery of three OGO craft to NASA within three years at a cost of more than $15,000,000.

OGO will be NASA's first standardized satellite, with a stock model structure, basic power supply, attitude control, telemetry and command system. It will be able to carry 50 different geophysical experiments on any one mission in its compartments. For this reason, it is referred to as the "streetcar" satellite.

The thousand-pound standardized satellite will be launched by an Atlas Agena B vehicle. Its weight includes 150 pounds of scientific experiments. Two six-feet-square solar paddles will be attached to OGO, which will be six feet long and three feet wide.

OGO will be stabilized so that its axis will point toward the earth and will be equipped with both gas jets and reaction wheels for attitude control.

An OGO-EGO will go on the first mission, a study of energetic particles in an eccentric orbit with altitude variations from 170 miles to 70,000 miles from earth.

POGO, scheduled to follow EGO nine months later, will have an altitude range of 120 to 650 miles above the earth. It will be used to study the atmosphere and ionosphere.

• Science News Letter, 79:40 January 21, 1961

PHARMACOLOGY

New Peroxide Ointment Found More Effective

➤ PRELIMINARY STUDIES of a hydrogen peroxide ointment showed it to be three times more effective than sulfadiazine against staphylococcus.

Drs. Herbert M. Cobe and Emanuel Loumis of Temple University, Philadelphia, reported that the T-3 ointment was urea peroxide in a glycerol solution.

It differs from the usual ointments in that it contains no water, which has an important effect when T-3 comes in contact with body fluids such as pus and blood.

• Science News Letter, 79:40 January 21, 1961

IN SCIEN

MEDICINE

Find Cases of Paralysis From Wartime Syphilis

➤ GENERAL PARALYSIS of the insane, or paresis, a disease almost forgotten in recent years, is making a comeback.

The upsurge of G.P.I. during the past three years is believed due to cases of syphilis contracted during World War II and treated with just enough penicillin to mask the early stages of syphilis but not enough to eliminate it.

Drs. S. Bockner and N. Coltart of North Middlesex Hospital, London, report that until 1958 they saw only one or two cases of G.P.I. each year among the 500 mental patients admitted to their ward. In 1959, nine such cases were admitted, and another British group encountered 14 cases in a 17-month period in 1957-58.

In all cases of G.P.I. the Wassermann test for syphilis is positive. Frequently the patient has slurred speech, tremor of the tongue and lips, and abnormal pupils. Mental abnormalities may include disorientation and confusion regarding times, places and persons, manic excitement, irritability, delusions and amnesia, particularly for recent events.

Drs. Bockner and Coltart conclude in their report in the British Medical Journal, Jan. 7, 1961, "It is now 15 years since the 1939-45 war ended, about the correct time interval for the appearance of G.P.I. from syphilis contracted during the war . . . Our recent experience suggests that G.P.I. must once again be considered in the differential diagnosis of psychotic states."

• Science News Letter, 79:40 January 21, 1961

GENERAL SCIENCE

Underdeveloped Nations Get Equipment From Reds

➤ THE COMMUNIST BLOC is furnishing much more scientific and technical equipment than the Western world to such underdeveloped countries as Egypt, a scientist reported.

Dr. W. Albert Noyes Jr., professor of chemistry at the University of Rochester, Rochester, N. Y., and editor of the Journal of the American Chemical Society, said that on his visit to universities in Egypt he saw analytical chemical balances from Communist China and much mechanical equipment from East Germany. He found, however, very little equipment from Western Europe and the United States.

Dr. Noyes stressed the necessity of the U. S. helping to train scientists and engineers from Latin America, Africa, the Middle East and Asia. He spoke at the dedication of a new chemistry hall at Franklin Institute in Philadelphia.

• Science News Letter, 79:40 January 21, 1961

...E FIELDS

ZOOLOGY

Yellowstone Bears Sleep In Steam-Heated Den

➤ ONE OF THE FAMOUS Yellowstone Park black bears is again occupying a steam-heated den in geyserland for her long winter nap. Her two cubs are with her.

The den is pawed out of the upper rock layers of a hot spring formation. Fresh diggings of rocks and gravel and bear "signs" of fur and tracks can be seen at the entrance to the den. The winter home is heated by fumes from an unnamed active hot pool just below the den. Another bubbling spring lies a short distance above the den.

The bears' winter home is just across the road from Gem Pool on the main road between Old Faithful and Madison Junction.

The steam-heated quarters will be occupied until next spring when the bears' long winter sleep will be ended.

The black bear has one of the longest and most complete hibernations of any of the mammals.

• Science News Letter, 79:41 January 21, 1961

ECONOMICS

Coordination of Oil Import Policies Urged

➤ UNLESS both Western Europe and the United States coordinate their policies on importing oil within a common framework, the Western world will be in a "precarious" and dangerous position, when a serious international crisis erupts.

The subtle interdependence between European and United States oil import policies is not recognized on either side of the Atlantic, Sam H. Schurr, director of the energy and mineral resources program for Resources for the Future, Inc., reported at the American Association for the Advancement of Science meeting in New York.

The difference between the U. S. and Western European energy policies is based on their different evaluations of the dangers to security involved in depending on foreign oil imports.

The United States believes that security is gained by restricting the amount of low-cost oil imported into the country, whereas the Europeans favor more oil imports from widely separated sources so that no new crises such as the Suez will cut off their oil supply.

Another difference, Mr. Schurr said, is that the United States can rely mainly on its own rich sources of oil and Europe must rely on foreign sources for the future.

However, the Europeans are actually greatly influenced by the U. S. policy. If the United States seriously restricted the entry of foreign oil, this would strongly influence the price of oil on the world market. At the same time, if the import restrictions were dropped, investment in U. S. domestic oil exploration and development would be severely curtailed. This would make less oil reserves available in the United States, a source that Europe ultimately relies upon as their security safeguard.

Mr. Schurr strongly urges that the United States and Western Europe resolve these problems in the newly established Organization for Economic Cooperation and Development so that the Western world may have a stable, dependable energy policy.

• Science News Letter, 79:41 January 21, 1961

OCEANOGRAPHY

Marine Life Under Arctic Ice Studied

➤ THE FIRST PLANKTON samples collected by a submarine under the polar ice are now being studied by scientists in the United States.

The scientists are trying to determine the area where the marine life of the North Atlantic Ocean begins to mingle with that of the North Pacific.

Dr. George D. Grice, marine biologist at Woods Hole Oceanographic Institution, Woods Hole, Mass., and Dr. John Mohr, biologist at the University of Southern California, Los Angeles, are analyzing samples collected last summer by the nuclear submarine, Seadragon, during its voyage under the frozen ice of the North Pole.

The samples were collected by an automatic sampling device built for the trip. The device, attached to the submarine's conning tower, uses tiny nets for scooping samples of plankton each hour from the Arctic water. After each 24-hour run the sampler automatically shuts itself off. When the submarine surfaces, the samples are removed and frozen.

In the past, plankton samples from underneath the ice were obtained by lowering nets through holes drilled through the ice.

• Science News Letter, 79:41 January 21, 1961

GEOLOGY

Molybdenum Gives Clue For Finding Ore Deposits

➤ A METAL dissolved in streams in such small quantities it can scarcely be detected may lead prospectors to rich ore deposits.

Using a new method devised by U. S. Geological Survey scientists, less than one part per billion of this metal, molybdenum, in water can be detected. Molybdenum, a silvery white element similar to iron, is an important indicator of ore deposits because it is generally found with ores whose metals are needed for industrial purposes.

The metal is dissolved in water when streams flow through an area containing the ore deposits.

Streams are tested for traces of molybdenum by taking a water sample and passing it through a resin that traps the minute particles of metal. The resin is leached by an acid and, if the metal is present, the acid solution turns amber.

• Science News Letter, 79:41 January 21, 1961

TECHNOLOGY

Proposed Roller-Road Future Commuter System

➤ A HIGH-SPEED electric highway system may someday whisk rapid transit commuters to and from work. This system could probably solve the increasing problems of traffic jams on the highways and of overloaded public transportation systems.

The system, described as a Roller-Road, was recommended as a possible solution to the interurban transportation problem by Dr. Lawrence R. Hafstad, General Motors' vice president and director of research, to the 40th annual meeting of the Highway Research Board in Washington, D. C. Roller-Road can transport automobiles and their occupants in piggy-back fashion at speeds up to 150 miles per hour and commuters at speeds up to 75 miles per hour.

The highway would consist of a series of rubber rollers, similar to inverted roller skates, spaced 20 feet apart, and built on the ground. The rollers are powered by small individual motors. Flat-bottomed carriers for the automobiles would be supported and propelled by the rubber rollers. Guide rails on either side of the Roller-Road would steer the carriers along the rollers.

This new concept in mass transportation is said to be more reliable and safer than anything proposed thus far for solving the country's very complex transportation problems.

The Roller-Road was invented by two Westinghouse Electric Corporation engineers, Charles Kerr Jr. and Clarence Lynn.

• Science News Letter, 79:41 January 21, 1961

BIOCHEMISTRY

Antibiotic Decreases Irradiation Mutations

➤ THE ANTIBIOTIC actinomycin D cuts the number of irradiation-induced mutations of fruit flies in half.

Dr. Walter J. Burdette of the University of Utah College of Medicine, Salt Lake City, discovered this property of the drug while studying the number of tumors destroyed and the number of mutations produced by therapeutic irradiation of male fruit flies.

Actinomycin D, he found, not only reduced the number of tumors, but also counteracted the radiation by decreasing the number of mutations. The concentration of the drug needed to accomplish this was only one-thousandth of a percent in the culture medium on which the flies were raised.

Whether actinomycin D can produce a similar reduction in the frequency of natural mutations, those not produced by irradiation, is still to be determined. Dr. Burdette has not yet found just how the drug acts to reduce mutations.

However, he reports in Science, 133:40, 1961, it is of "interest" that there is a drug that can reduce this damaging effect of irradiation.

• Science News Letter, 79:41 January 21, 1961

METEOROLOGY

Volunteer Observers Help U.S.

Some 12,000 unsung citizens daily record weather observations for the U. S. Weather Bureau. They provide a valuable service to the country, Vincent Marteka reports.

► EARLY in the morning, when most people are just turning over in their sleep to catch a few more winks, a 96-year-old man living in a small, Midwestern town of Kansas walks through the morning mists to a small shelter near his home.

In this shelter, there is a thermometer and, nearby, an instrument for measuring rainfall. After checking the amount of rainfall, if any, and the temperature, he then writes his observations down on a small card.

Each day, at the same time, the same observations are made, and at the end of the month the card is sent to a regional Weather Bureau office. For 365 days a year for more than 25 years, he has gone through the same procedure.

The man is M. G. Stevenson, a funeral director from Ashland, Kans. He is one of the 12,000 volunteer weather observers throughout the country who record weather information for the U. S. Weather Bureau. Most serve without pay.

The observers collect such weather information as rainfall, temperature and wind velocity from weather instruments supplied free of charge by the Weather Bureau and placed on the volunteer's property.

In recognition of these unsung volunteers, the Bureau is issuing a booklet honoring them, since their contribution to weather forecasting is of great value to the nation.

Volunteers Aid Meteorologists

Although the Weather Bureau maintains a highly skilled staff of meteorologists and technicians, the information obtained from these volunteers aid meteorologists in accurately evaluating changes in climate in different areas throughout the United States. Because the information is sent only once a month into regional Weather Bureau offices, it does not have any effect on daily weather forecasting.

The volunteer weather observers come from all walks of life. Some are doctors, farmers, housewives and clergymen; others are members of Science Clubs of America, high school science clubs and local business groups. They come from the rural villages of New England, the peaceful countryside of Alabama, the plains of Kansas, and the heavily populated California coastline.

The volunteers are proud, conscientious and dedicated persons who sacrifice much of their time in order to keep accurate daily records for the Weather Bureau. If the records are to be effective, readings should be taken at about the same time each day.

A Benedictine monk, Fr. Adelhelm Hess, of Conception, Mo., has been taking daily readings for more than 60 years, and four generations of the Towers family in Rome, Ga., have provided weather observations for more than 100 years.

However, sometimes the daily readings are not always accomplished for one reason or another. Charles C. Smith once had to take his reading in the middle of the night because he forgot to do so during the day.

When volunteer observer Mabel Hunt of Burlington, Kans., was hospitalized, she had to get two neighbors to record her observations because her original replacement also became ill.

Sometimes groups, such as the high school science clubs affiliated with the Science Clubs of America, man volunteer weather stations as part of a science project. By actually observing and recording weather data, the student scientists acquire a better understanding and interest in the world of science. Some students even have their own volunteer weather station.

The Government has used volunteer weather observers for more than a century.

In 1848, James P. Espy became the first meteorologist of the U. S. Government. It was shortly thereafter that the first volunteer weather observer became an integral part in weather forecasting.

Prior to 1848, however, private citizens were already taking weather observations for their own benefit. Thomas Jefferson, the third President and a man of many interests, recorded the weather with crude instruments from 1776 to 1816.

Today, the volunteer is much better equipped than his predecessors. If a citizen wants to become a volunteer weather observer, and observations are needed in that area, the Weather Bureau will set up weather instruments on the volunteer's property. These instruments are owned by the Government and are installed on the property at no cost to the owner.

The types of instruments used depend on the amount of weather information needed in the particular area.

Typical "Weather Station"

A typical volunteer "weather station" consists of a thermometer and a rain gauge. The thermometer, which is actually two thermometers attached to a metal plate, measures the highest and lowest daily temperature, and is housed in a shelter to protect it from wind gusts that might cause incorrect readings.

The rain gauge looks like a stovepipe stuck into the ground. Inside there is a small cylinder, for collecting rainwater, with a "ruler" marked in inches of rainfall. After a rainstorm the volunteer measures the amount of rainfall by the height of the water level in the cylinder.

Some stations also have a pan of water from which rate of evaporation can be measured, and an anemometer, a cupped

DEDICATED VOLUNTEERS—Members of the Towers family in Rome, Ga., have been taking weather observations for more than a century. Fifty-six of the years of weather observing are represented by these members of the Towers family.

instrument for measuring wind velocity.

The fun of watching the weather change is not limited to volunteer weather observers. Any interested person can set up his own station by buying the same type of weather equipment from manufacturers whose products the Weather Bureau uses. The equipment ranges from a simple thermometer to complex radar sets for tracking storms.

Volunteer weather observers are not needed in the heavily populated eastern part of the country. If you live in these areas, do not bother contacting the Weather Bureau. They have more than enough volunteers for this area, along with a long waiting list.

However, if you live in sparsely settled areas such as the western Great Plains states or Alaska and want to join this unique group of dedicated volunteers who provide such a valuable service to the country, you would probably be a most welcome member.

The information sent into the regional Weather Bureau offices each month from the weather observers throughout the country are collated and put on punch cards. They include the high and low temperatures for the month, and the amount of evaporation, rainfall and snowfall, if any. The information is then grouped according to states.

On the basis of this information, the country is divided into broad climatic areas having similar weather characteristics. Dry desert areas, cold mountainous regions and windy coastal plains cross the width and length of the country without regard to such man-made boundaries as state lines. Observers in desert regions seldom measure rainfall, whereas those living high in the Rocky Mountains keep busy recording the big winter snowfalls.

Woodsmen, scientists and private citizens are among users of the weather information supplied by the volunteers. Before choosing a missile site in California, a Government agency pored over the temperature records of different regions looking for those with an ideal climate for missile firings.

Meteorologists incorporate the data into the framework of their weather patterns and studies of past climates. Even a newly married couple once consulted old weather records before deciding on a location for building their "dream home."

• Science News Letter, 79:42 January 21, 1961

ROCKETS AND MISSILES

Latest Flying Launcher Carries Skybolt Missiles

See Front Cover

THE B-52H STRATOFORTRESS carries four Skybolt missiles and has a flying range of over 10,000 miles. When the Skybolt becomes operational it can be launched as far as 1,000 miles away from its targets, eliminating the need for a bomber to come close to hostile territory. The Skybolt will travel to its target at hypersonic speeds. The B-52H is being produced for U. S. Strategic Air Command by Boeing Airplane Company, Wichita, Kan.

• Science News Letter, 79:43 January 21, 1961

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BIOCHEMICAL ASPECTS OF MICROBIAL PATHOGENECITY—Werner Braun, Ed.—*N.Y. Acad. of Sciences*, Annals, Vol. 88, Art. 5, 297 p., illus., paper, $5. Assembles current knowledge of molecular mechanisms pertaining to problems of microbial pathogenesis.

BIOCHEMISTRY AND PHARMACOLOGY OF COMPOUNDS DERIVED FROM MARINE ORGANISMS—Ross F. Nigrelli, Ed.—*N.Y. Acad. of Sciences*, Annals, Vol. 90, Art. 3, 334 p., illus., paper, $5. Among others, papers discuss venom of stonefish, weaverfish, shellfish and puffer.

BIRDS OF THE PHILIPPINE ISLANDS: Siquijor, Mount Malindang, Bohol and Samar—Austin L. Rand and Dioscoro S. Rabor—*Chicago Nat. Hist. Mus.*, 216 p., paper, $4. Study of tropical birds found on four of the 7100 Philippine Islands.

BLOCK AND GRAFT POLYMERS—William J. Burlant and Allan S. Hoffman—*Reinhold*, 166 p., $7.95. Summarizes, qualitatively, the reactions and experimental techniques used to initiate block and graft polymerization, and demonstrates the possibility of "molecular engineering" of polymers.

THE BOY'S BOOK OF MEDICAL SCIENCE—L. R. Celestin—*Roy Pubs.*, 143 p., illus., $3.50. Introduces young reader to the world of medicine and medical electronics.

DICTIONARY OF AMERICAN SPORTS—John S. Salak, Ed.—*Philosophical Lib.*, 491 p., $10. Explains more than 6,000 terms, from "abaft (nautical)" to "zone line."

THE FOREST AND THE SEA: A Look at the Economy of Nature and the Ecology of Man—Marston Bates—*Random House*, 277 p., $3.95. Combining scholarship and readability, book examines the life of forests, lakes, grasslands, deserts, coral reefs and open seas, as well as man's place in nature.

FUN WITH ELECTRICITY—Tom Kennedy, Jr.—*Gernsback*, 128 p., illus., $3.75; paper $2.65. Simple explanation of electricity and instructions for building electrical devices.

AN INTRODUCTION TO ASTRONOMY—Robert H. Baker—*Van Nostrand*, 6th ed., 364 p., illus., $5.50. Introductory textbook, revised to include IGY accomplishments and scientific findings, radio astronomy and new chapter on stellar evolution.

INTRODUCTION TO CERAMICS—W. D. Kingery—*Wiley*, 781 p., illus., $15. Textbook featuring extensive descriptions of the micro-structure and properties of physical ceramics as illustrative material for the application to real problems.

INTRODUCTION TO ELECTRONICS: A Tutor Text—Robert J. Hughes and Peter Pipe—*Doubleday*, 421 p., illus., $3.95. Uses effective new approach to self-teaching, the automatic tutoring system, explaining principles of electronics in terms of radio communication.

INTRODUCTION TO INDIA—Beatrice Pitney Lamb—*Am. Assn. of University Women*, 50 p., map, paper, $1. Presents principal facets of Indian history and culture, and reviews the fundamental economic and social questions for which India is seeking answers.

MANAGEMENT GUIDE TO APPLIED INDUSTRIAL PSYCHOLOGY—Bernard T. Lewis and William W. Pearson—*Rider, J. F.*, 74 p., illus., paper, $1.50. Discusses principles of leadership and supervision, motivation and morale of workers, psychological testing and mental health in industry.

NEW HORIZONS FOR COLLEGE WOMEN—Leo C. Muller and Quida G. Muller, Eds., foreword by Ernest C. Hollis—*Public Affairs Press*, 128 p., $3.25. Papers presented at 1960 Symposium in celebration of the 75th anniversary of the Mississippi State College for Women.

POLICY PLANNING FOR SPACE TELECOMMUNICATIONS: Staff Report—Committee on Aeronautical and Space Sciences, U. S. Senate—*GPO*, 207 p., paper, 55¢. Reflects the emerging significance of artificial satellites for global communication.

POWER STATIONS WORK LIKE THIS—Rolt Hammond—*Roy Pubs.*, 57 p., illus., $2.95. British book for young people, explains how a power station is planned, how different turbines work, and how electricity is transmitted to its users.

PROSPECTUS ON RESEARCH: Research Recommendation Proposed by the Forums—White House Conference on Children and Youth, 1960—*GPO*, 39 p., paper, 25¢. Recommends research needed in various areas for bettering the condition of children and youth.

REACHING FOR THE STARS—Erik Bergaust, introd. by Frederick C. Durant, III—*Doubleday*, 407 p., photographs, $4.95. Biography of one of the pioneers in space rocketry, Wernher von Braun, based on personal acquaintance.

SILICON AND ITS BINARY SYSTEMS—A. S. Berezhnoi, transl. from Russian—*Consultants Bureau*, 275 p., illus., $8.50. Critical review and evaluation of binary compounds of silicon, with bibliography covering the past 40 years.

SLEEP THERAPY IN THE NEUROSES—B. V. Andreev, transl. from Russian by Basil Haigh—*Consultants Bureau*, 114 p., illus., $8.50. Evaluates Russian experiences with sleep treatment and elaborates safe and controllable techniques for its application.

SLIDE MANUAL: A Guide to the Preparation and Use of Projection Slides—W. R. Moran and others—*Am. Assn. of Petroleum Geologists*, 28 p., illus., paper, $1.25. Basic information on how to prepare copy for slides and transparencies, and on their production and use in presenting technical papers.

SPECTRA AND ANALYSIS—A. A. Kharkevich, transl. from Russian—*Consultants Bureau*, 222 p., $8.75. Presents the basic theory of spectra within a framework corresponding to the requirements of electronic engineering, on a somewhat advanced level.

THE STORY OF ARCHAEOLOGY IN THE AMERICAS—Mary Elting and Franklin Folsom, reviewed for scientific accuracy by J. Alden Mason—*Harvey House*, 160 p., illus. by Kathleen Elgin, $2.95. Attractive book for young people, shows how archaeologists piece together the evidence from the past.

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• Science News Letter, 79:44 January 21, 1961

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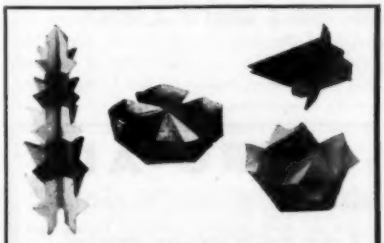

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GENERAL SCIENCE

Guard Against Pressures

➤ SCIENTISTS MUST GUARD against the breakdown of their integrity by the pressure of social and political forces, Dr. Barry Commoner, biologist of Washington University, St. Louis, Mo., warned.

"The perversion of German science and scientists under the Nazis is a case in point of what can happen when science gets under political influence," Dr. Commoner told SCIENCE SERVICE. Dr. Commoner is chairman of the committee on science in the promotion of human welfare, a standing committee of the American Association for the Advancement of Science.

Medical atrocities and other inhuman experiments were performed in the name of science by German scientists who yielded to the political pressures of the Hitler regime.

"It is important to remember this history in order to understand what can happen when scientific integrity bows to social and political considerations," he said.

As part of their responsibility to promote human welfare, the scientist today must anticipate problems rather than wait until they occur before taking action. The current fight against air pollution is an example. "It would have been better to have worked to prevent the pollution of our air rather than try to remove the pollutants as now we must," Dr. Commonner said.

The scientists must alert the community to dangers before economic investments add to the problem. This is what is happening in the area of food additives, Dr. Commoner remarked.

"The danger of food additives is a very serious one," he said. "Economic investment by food industries already has moved to the point where serious economic problems may be involved in limiting and controlling the use of additives, as considerations of health and welfare demand."

He called on all scientists, but particularly biologists, to work with the community in considering such problems as radiation hazards, water pollution, insecticides and food additives.

Since the committee he heads was established two years ago, both interest and action by the scientific community in these areas has been stimulated and progress has already resulted.

An illustration of progress is the change in attitude by the Federal Government toward the problem of radiation from fallout and nuclear development, Dr. Commoner said. The establishment of the Federal Radiation Council by the Congress and the administration was a reflection of concern over the danger to health and welfare that atomic power development may bring.

• Science News Letter, 79:46 January 21, 1961

Confusion on Radiation

➤ THE SCIENTIFIC community has confused the public on the hazards and other effects of radiation, Irving Michelson, director of public service projects for Consumers Union of U. S., Inc., has charged.

Scientists have failed to merit the trust of the consumer in the embryonic nuclear age, he told the American Association for the Advancement of Science.

The public has been subject to a variety of "scientific pronouncements" in which opinions are frequently stated as facts. Opposing statements from the scientific community add to the confusion.

"Under such conditions, the public can only be impressed with the untrustworthiness of scientific opinion," Mr. Michelson said. They are justified in making such uncomplimentary judgments as that scientists are not telling all they know.

Under a grant from the Atomic Energy Commission, Consumers Union is making an extensive study of the radioactivity in foods: five man-made and three naturally-occurring. It also is participating in a study of strontium-90 in baby teeth being conducted by the Greater St. Louis Citizens Committee for Nuclear Information.

Mr. Michelson reported that an AEC official stated informally that the public is more likely to believe CU than the AEC. This statement, he said, "shows how serious is the problem of communication between the scientific community and the public." He credited the AAAS for working to correct the problem.

• Science News Letter, 79:46 January 21, 1961

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Do You Know

Early Greeks used bronze containing small percentages of nickel for their *coins*.

Copper, one of the first metals used by man, was worked as early as 7500 B.C.

Lung *cancer* occurs 20 times more frequently among patients with tuberculosis than in the general population.

The *floors* of homes in the Middle East in the fifth and sixth centuries were commonly mosaics of coarse white cubes, or tesserae.

Russia has intercontinental ballistic *missiles* that can be aimed accurately and reach any U. S. target within 30 minutes.

Such *diseases* as streptococcosis, milk-borne bovine tuberculosis and brucellosis are rapidly disappearing in the United States because of herd control, vaccination and the use of antibiotics.

White *gold* is pure gold whitened and hardened by adding nickel.

• Science News Letter, 79:46 January 21, 1961

INVENTION

Highway Safety Devices And "Cool" Suit Patented

▶ PERSONS TRAVELING on their vacations with a trailer attached to the car can now have a much safer trip, according to one patent issued in Washington, D. C.

The patent, No. 2,966,965, awarded to Carlyle B. Stair of Glendale, Calif., provides a brake that would immediately stop the trailer in case it accidentally is separated from the car while in motion. At the time car and trailer become uncoupled, pressurized gas is automatically released from a cartridge, attached to the trailer, exerting pressure on a cylinder piston. The piston then transmits a braking force to the trailer brakes.

Another highway safety device won patent No. 2,966,877 for William G. Konold and John A. Finken, both of Falls Church, Va. Their invention, assigned to George Mingle of Columbus, Ohio, is an improved, portable signal device that warns approaching motorists of a dangerous accident or a washed out bridge ahead.

The cars would drive over a tripping mechanism across the road that would blow a horn or siren and also light up a warning light in the portable unit. The horn or siren is energized from a supply of gas under pressure. When the device is tripped, a valve opens permitting the gas to pass over a diaphragm, vibrating it in such a way as to generate the warning sound.

Other patents awarded include new alloys highly resistant to heat for possible use in jet engines. The alloys, patented by James F. Baldwin of New York City, also resist scaling, rusting and other forms of deterioration from oxidation at high temperatures.

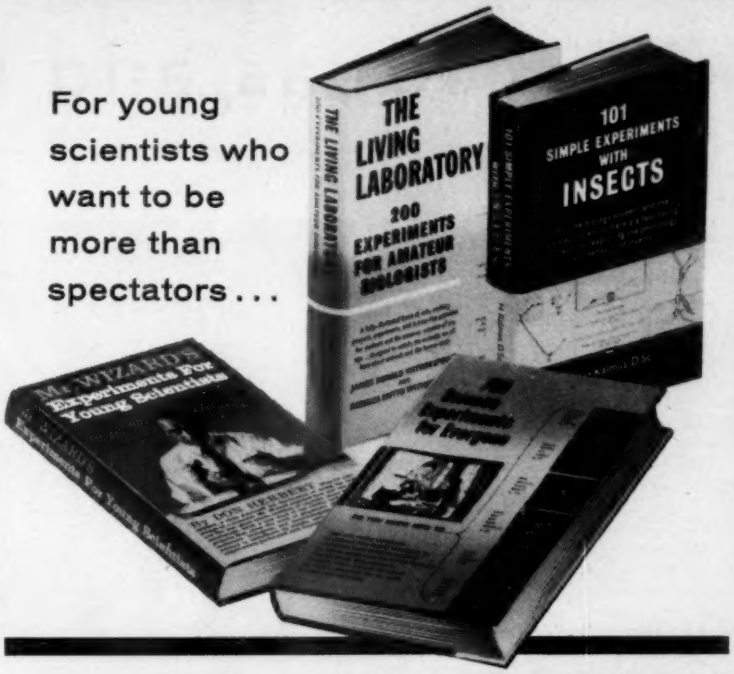
The alloys, containing varying amounts of carbon, iron, chromium, tungsten and cobalt, are hardened by heating to temperatures between 1,800 and 2,000 degrees Fahrenheit and then rapidly cooled by dousing them with water. This hardness makes the alloys ideally suited for materials of the high temperature jet age, it is claimed in patent No. 2,967,103.

A suit that protects a human from extremely high temperatures won patent No. 2,966,684 for John H. Bonin of Chicago. Besides providing insulation from high temperatures, the outfit also cools and conditions the person wearing it. Air under pressure is fed through tubes lining the entire suit, removing any heat that passed through the insulating material. The air, which also picks up the moisture in perspiration from the body, is then exhaled through openings in the suit.

Patent rights on the invention were assigned to the United States of America as represented by the Secretary of the Army.

One way to keep the next door neighbor's chickens from eating all the seeds in your garden is to sprinkle some food containing the bird repellent of patent No. 2,967,128.

Morley R. Kare of Ithaca, N. Y., has developed a flavor compound that is completely distasteful to birds, but, surprisingly, pleasing to humans.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SABLE-TIPPED LIPBRUSH is protected in a decorated case of acetate plastic. A push button releases the brush and retracts it when not in use so that the brush is kept sanitary and cannot stain other articles in a handbag.

• Science News Letter, 79:48 January 21, 1961

WALL SCROLL comes in two designs hand-screened on textured cotton and framed in ebony. An abstract design is black and red on natural; also on natural cotton is a Roman goddess in black and gray. Each scroll measures 17 x 47 inches.

• Science News Letter, 79:48 January 21, 1961

VENETIAN BLIND COATING, a water-like fluid, makes painted blind surfaces so slick dirt cannot cling. The coating leaves a clear, colorless film that is insoluble in water, lasts indefinitely and does not discolor slats. The blinds stay clean longer and then are easier to clean.

• Science News Letter, 79:48 January 21, 1961

PLASTIC ANIMAL SCULPTURES that look as if handcarved from a block of fine walnut are executed with great intricacy. Unlike wood sculptures, the tough acetate plastic figures, shown in the photograph, require no more care than an occasional dusting or wiping with a damp cloth. The 12 figures in the series include horses, cattle and dogs.

• Science News Letter, 79:48 January 21, 1961

WORLD WIDE MONEY GUIDE for travelers shows the exact value of United States money in foreign currency. Easy to use, the guide is in a handy pocket size with case in red or black with gold.

• Science News Letter, 79:48 January 21, 1961

HOUSEHOLD LOCK enables the homeowner to keep his door chain-locked while at home or away. The device combines the ordinary chain-and-slide with a key-operated cylinder lock. To unchain the door from inside, the slide is released. A key permits unlocking the cylinder lock from outside the partly opened door.

• Science News Letter, 79:48 January 21, 1961

FISHING FLY AND HOOK BOXES have permanently attached magnetic strips to hold hooks and flies in an orderly way for easy selection. Hook box holds fishing hooks with leaders up to eight inches long; fly box has two strips to hold the flies.

• Science News Letter, 79:48 January 21, 1961

AIR PURIFIER is a portable, five-pound unit which can be plugged into any electrical outlet. Of spun anodized aluminum the device forces air through activated carbon, purifying and recirculating the air. Useful in various home areas, it will destroy undesirable odors, prevent smoke irritation and provide relief from many allergies.

• Science News Letter, 79:48 January 21, 1961

Nature Ramblings

➤ FAR TO THE NORTH, on the Arctic tundra, reindeer, caribou and musk ox are scraping the snow for a favorite food, reindeer moss. This "moss" is not a moss at all, but a type of lichen. In Nova Scotia, the Acadia of Longfellow's poem, the "murmuring pines and the hemlocks, bearded with moss," the "moss" is, again, a lichen.

For many years, lichens were thought to be a separate phylum of plants, but they are actually an intimately interwoven web of fungi and algae. Living in this symbiotic, or mutually beneficial, relationship, the fungi are mildly parasitic on the algae, from which they receive their food, and, in return, are believed to aid the algae in absorbing and retaining water. Lichen algae can be grown without the lichen fungi, but the fungi cannot survive without the algae.

Lichens are divided into three general groups: Fruticose lichens are erect or hanging, branched structures; foliose lichens are flattened, often leaf-like bodies, and crustose lichens form hard, granular crusts on rocks and bark.

Lichens

From bleak mountaintop to arid desert lichens can be expected to show up in most unlikely places. Their various colors, from white to yellow, orange, yellowish-green, grayish-green, brown or black, are displayed on fenceposts, tombstones, tree bark or the foundations of old houses.

Lichens have served as food since pre-Christian times. Fragments have been found in foodstuffs in Egyptian tombs, and the manna mentioned in the Bible is believed to have been the lichen, *Lecanora esculenta*, which is still eaten by desert tribes of Asia Minor. In the subarctic areas and in India and Japan lichens are harvested and dried for human or domestic animal food. Lower forms of life, such as mites, caterpillars, earwigs, termites, snails and slugs, also feed on certain lichen species.

Numerous medicinal benefits have been attributed to lichens. Although most of the so-called benefits are without scientific basis, one lichen from Iceland produces a mucilaginous substance that has laxative properties. This substance also is used in salves, puddings, culture media for bacteria, sizings for paper and calicoes, and in isinglass.

Other lichens serve as ingredients for cosmetics, while still others contain tannin and are used for tanning animal hides. In certain areas of Russia and Siberia, lichens are substituted for hops in the brewing of beer.

Perhaps the most widely used product from lichens is the dye known as litmus, a chemical indicator of acidity and alkalinity.

—GLORIA BALL

• Science News Letter, 79:48 January 21, 1961